ST. LOUIS ARMY AMMUNITION PLANT

SITE-SPECIFIC ENVIRONMENTAL BASELINE SURVEY

Preliminary Review of SSEBS Findings

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SSEBS & Risk Assessment Status

- **Review of Environmental Baseline Survey (EBS) and Development of SSEBS Work Plan** - May '01- July '02
- **Results of Initial SSEBS Field Investigation**
  - Field Investigation - August - September '02
  - Quality Control Summary Report (QCSR) - December '02
  - Interim Data Report - February '03
- **Status of Contingency Sampling Program (CSP)**
  - Workplan Development - October '02 - April '03
  - Field Investigation - April - May '03
  - Draft QCSR - May - June '03
- **SSEBS Report** - Draft 29 August (Rev. Comments - 12 Sept. - Final - 26 Sept.)
- **Baseline Human Health Risk Assessment (HHRA) Report** - Draft - 2 Sept. (Rev. Comments - 15 Sept. - Final - 29 Sept.)
- **Building 2 Superstructure Evaluation**

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Review of EBS for Development of SSEBS Work Plan

- Installation/sampling of 9 groundwater monitoring wells
- Asbestos Containing Material (ACM) survey
- 34 soil borings
- 49 wipe samples
- 21 sediment/surface soil samples
- 4 wastewater/sump samples
- 24 concrete samples

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Areas Requiring Further Investigation in SSEBS

- Site Wide
  - Sewer System
  - Underground Storage Tank (UST) areas
  - Transformer areas
  - Metal storage areas
  - Sumps
  - Groundwater
- Buildings - 1, 2, 4, 5, 6, 7, 8, 9 & 10

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SSEBS Work Plan

- Address areas identified as requiring additional investigation
- Collect unbiased data for a HHRA
- Phased approach to sample collection
  - Initial round of primary samples
  - Subsequent round of contingency samples to further define extent of contamination

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SSEBS Work Plan (cont.)

- Establish Screening Levels (SLs) for Chemicals of Concern (COCs) at the Site
  - Selection of SLs that ensures data that supports assessment of risk and allows flexibility in the decision making process
    - EPA Region IX Residential Preliminary Remediation Goals (PRGs)
    - Cleanup Levels for Missouri (CALM) - Scenario A (Residential)
    - Background levels determined for Metals and PAHs

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Results of SSEBS Field Investigation

Field work 12 August - 20 September 2002

- Regional Background Soils for Metals & PAHs
- Buildings 1, 2, 4, 5, 6, 7, 8, & 10
- Northeast Parking Area
- Railroads
- Roadways, including former Bldg. 9
- Sewer System
- Groundwater

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SSEBS Field Investigation Activities

- Installation of 4 new groundwater monitoring wells (MWs)
- 13 groundwater MW samples plus water from on-site hydrant
- 20 Asbestos samples from refractory bricks in Building 2
- 18 Concrete floor samples from Buildings 1, 2 &4
- 6 Mastic samples from flooring in Buildings 5 and 6
- 2 Product samples from pipes and equipment in Building 2
- 8 Sediment samples (5 from site sewers, 2 from pipe tunnels, 1 from Building 6 air ducts)
- 11 Surface Wipe samples from Buildings 2, 4, 5, and 6
- 666 Soil samples from 251 boring locations
- 10 Wastewater samples from site sewers

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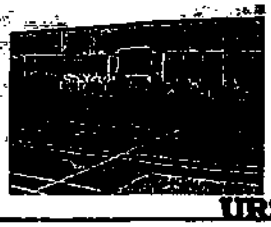
Building 1

Concrete: Samples collected at 0-1" and 2-3" depths from 1 location.

PCBs detected in the 0-1" sample (No SL)



Soil: PCBs exceeded the SL under a Process Sump.
Arsenic exceeded the SL in one sample in the east parking lot.
Copper exceeded SL in one RA sample.
PAHs exceeded SLs in 2 RA samples.

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Building 2

Soils:
Dioxins: 36 detections above SL at depths ranging from surface to over 15 feet below the surface.
PCBs - 5 Detections above SL

Soils:
Metals - Beryllium & Lead exceeded the SL in one sample

TPH - 7 Detections above SL
VOCs - 1 Detection of 1,1- DCE above SL

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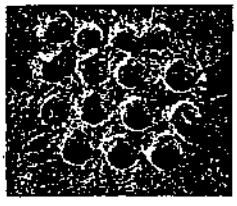
Building 2 Results (cont.)

Concrete:
PCBs detected in 9 samples collected from 0-1" depth (No SLs)



Surface Wipes:
PCBs were detected in a sample from oil-coated wires in a trench (No SLs)

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Building 2 Results (cont.)

- **Product Samples:**
  - PCBs detected in product sample in SE corner of building (No SL)

- No PCBs detected in product sample from West Mezzanine - Switchgear

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Building 4

Concrete Samples - collected at 0-1" and 2-3" depths. PCBs detected in 2 of the 0-1" samples (No SLs).
Surface Wipes - No PCBs detected above SLs.

Soils: No PCBs, Pesticides, TPH or VOCs detected above SLs. 4 samples exceeded Beryllium SL. 3 samples exceeded PAH SLs.

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Building 5 Results

- Mastic - All 3 samples had detections for PCBs (No SLs)
- Surface Wipe - No detections above the SL for PCBs

- **Soil Borings** -
  Oil Storage Pad - 6 PAHs exceeded SLs at 9 - 10 ft. bgs.
  - no detections above the SL for TPH
  Risk Assessment Locations - Lead, 8 PAHs & 2 Pesticides exceeded SLs at one location at the shallow depth

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Building 6

Mastic - PCBs detected in all 3 samples (No SLs)
Sediment - 5 Metals exceeded Soil SLs from old HVAC system duct

Surface Wipes - No detections above SLs
Soils:
Oil Storage Pad - no detections above SLs
Risk Assessment Borings in Basement
- 4,4'-DDT exceeded SL at both depths in one boring.
- Beryllium and Mercury exceeded SLs in 5 and 4 samples, respectively.

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Building 7

Concrete - TPH-DRO exceeded Soil SL in 1 sample collected at 0-1"

Soils:
- PCBs SL in a RA sample
- Beryllium & Lead exceeded SLs in samples twice & once, respectively
- 7 samples exceeded SL for PAHs

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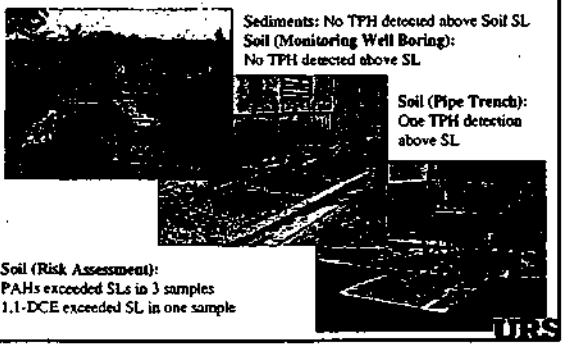
Building 8



Sediments: No TPH detected above Soil SL
Soil (Monitoring Well Boring): No TPH detected above SL

Soil (Pipe Trench): One TPH detection above SL

Soil (Risk Assessment):
PAHs exceeded SLs in 3 samples
1,1-DCE exceeded SL in one sample

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Building 10

- **Soil** - No BTEX or TPH exceeded SLs
- **Sewer Borings** -TPH exceeded SL in 3 samples including 2 discretionary deeper borings and one boring NE of Bldg. 10

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Additional Risk Assessment Areas

Northeast Parking Area - One soil sample above SLs for 6 PAHs
- No Detections above SLs for Metals, PCBs or VOCs

Railroads - exceeded 1,1-DCE SL in one soil sample and Beryllium SL in another sample

Roadways - SLs exceeded for Antimony in 1 sample, Beryllium in 5 samples, 1,1-DCE in 1 sample, and PAHs in 1 sample

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Sewer System Survey

Sediment Results:
Metals - 14 Detections of 6 metals above Soil SLs
PCBs - 8 Detections above Soil SLs
SVOCs - 19 detections above Soil SLs in 3 samples
TPH - 5 Detections above Soil SLs
VOCs - 8 Detections above Soil SLs in 3 samples

Wastewater Results:
PCBs - 10 Detections above Groundwater (GW) SL
SVOCs - 45 Detections above GW SLs
VOCs - 15 Detections above GW SLs
Metals - 19 Detections above GW SLs (Arsenic-10, Cadmium-1 & Lead-8)

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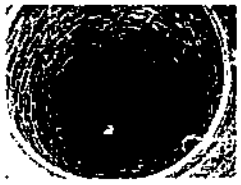
Sewer Soil Boring Results

- Metals - 17 Detections of Beryllium above SL
- PAHs - 7 Detections above SL in one sample
- TPH - 3 Detections above SL



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Groundwater

- No water bearing units identified during installation of four new wells
- No recorded precipitation for 28 days prior to sampling, rain every day during sampling
- Metals
  - Arsenic- Detected in all thirteen monitoring wells above SL
  - Lead - Detected in one well above SL
- SVOCs - Eight compounds detected above SLs (at least one compound detected in every well)
- VOCs - Four compounds detected above SL in only one monitoring well (1,1-DCE, 1,2-DCA, Carbon Tet., Chloroform in 02MW-01)
- Indicator Parameters - Chloride, Fluoride & Chlorine Residual

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Contingency Sampling Program Status

- **Draft Workplan** Submitted 12 February 2003
- **Final Workplan** Submitted 17 April 2003
- **Field Investigations** 28 April - 8 May 2003
  - 2 rounds of water levels from site wells
  - 1 Sediment sample from sewer manhole north of Bldg. 2
  - 91 Soil samples from 51 boring locations
- All initial analytical lab reports received on 23 May 2003
- All corrected analytical lab reports received on 30 May 2003

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Quality Control Summary Report (QCSR)

- Quality Control document for review by the Army
- Establishes data quality for use in SSEBS & HHRA
- Preliminary Results:
  - 12 Soil Boring samples around Bldg. 2 contain dioxins above SLs at depths ranging from surface to 10 feet below surface.
  - Dioxin detected in Sediment Sample from Sewer North of Bldg. 2
- **Draft** Due 27 June 2003
- **Final** Due 25 July 2003

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SSEBS Report

- Introduction
- Site Background
- Investigation Areas
- Summary of Nature and Extent of Contamination
- Summary of Contaminant Fate and Transport
- Conclusions
  - Investigation Areas Requiring Additional Investigation
  - Investigation Areas Requiring No Further Action
  - Investigation Areas to Be Addressed In the HHBRA
- **Draft** - 29 August (Rev. Comments Due - 12 September)
- **Final** - 26 September

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Baseline Human Health Risk Assessment (HHRA)

- SLAAP HHRA to support potential property transfer.
- Most likely future use of the site is industrial or commercial,
  - additional less likely scenarios are also evaluated.
- Results of the HHRA used to support:
  - a "no action" determination,
  - deed restriction,
  - site cleanup,
  - or some combination thereof.

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Baseline HHRA (cont.)

- Soil is primary medium of concern.
  - Groundwater not used in the area and exposure potential is limited.
  - Buildings are evaluated separately using existing standards.
- Areas of Concern (AOCs)
  - Individual building footprints
  - Areas surrounding buildings
- Chemicals of Potential Concern (COPCs)
  - PCBs and PAHs appear to be the primary COPCs, although other chemicals (pesticides, metals, etc.) are in some AOCs.
  - Dioxin is a big unknown as it has only been characterized in and around Building 2.

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Baseline HHRA (cont.)

- Status of HHRA
  - Data from the initial investigation have been collected, validated and entered into database.
  - COPC screening is underway.
  - Data from the Contingency Sampling Program will only be used for hotspot evaluation
- **Draft** - 2 September
- **Review Comments Due** - 15 September
- **Final** - 29 September

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* Maybe have to help MDNR with Risk Assessment evaluations

Building 2 Superstructure Characterization Study

Sampling for dioxins is required because 2,3,7,8- TCDD is an acutely hazardous waste to indicate it's absence or presence on building materials

Purpose: Characterize building materials to evaluate:
- demolition methods (worker health & potential releases)
- options for disposal of the various building debris.

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